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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	10/802,803
Filing Date	March 18, 2004
First Named Inventor	Lars Jørn STENBERG
Art Unit	2615
Examiner Name	Huyen D. LE
Attorney Docket Number	45900-000791/US

ENCLOSURES *(check all that apply)*

- ☒ Fee Transmittal Form
  - ☒ Fee Attached
- ☐ Request for Reconsideration
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
- ☐ After Allowance Communication to Technology Center (TC)
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☒ Appeal Communication to TC (Appeal Notice, **Brief**, Reply Brief)
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) *(please identify below)*:

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Harness, Dickey & Pierce, P.L.C.		
Signature			
Printed name	John A. Castellano		
Date	July 14, 2008	Reg. No.	35,094

CERTIFICATE OF TRANSMISSION/MAILING

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FEE TRANSMITTAL for FY 2008

Effective 2/8/2006. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 510

Complete if Known	
Application Number	10/802,803
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METHOD OF PAYMENT *(check all that apply)*

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☐ Deposit Account:

Deposit Account Number: 08-0750

Deposit Account Name: Harness, Dickey & Pierce, PLC

The Director is authorized to: *(check all that apply)*
☐ Charge fee(s) indicated below ☒ Credit any overpayments
☒ Charge any additional fee(s) during the pendency of this application
☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1011	310	2011	155	Utility filing fee	
1012	210	2012	105	Design filing fee	
1013	210	2013	105	Plant filing fee	
1014	310	2014	155	Reissue filing fee	
1005	210	2005	105	Provisional filling fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

			Extra Claims		Fee from below	=	Fee Paid
Total Claims	10	-20 ** =	0	X	50	=	0
Independent Claims	1	-3 ** =	0	X	210	=	0
Multiple Dependent						=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	50	2202	25	Claims in excess of 20
1201	210	2201	105	Independent claims in excess of 3
1203	370	2203	185	Multiple dependent claim, if not paid
1204	210	2204	105	** Reissue independent claims over original patent
1205	50	2205	25	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	120	2251	60	Extension for reply within first month	
1252	460	2252	230	Extension for reply within second month	
1253	1,050	2253	525	Extension for reply within third month	
1254	1,640	2254	820	Extension for reply within fourth month	
1255	2,230	2255	1,115	Extension for reply within fifth month	
1401	510	2401	255	Notice of Appeal	
1402	510	2402	255	Filing a brief in support of an appeal	510
1403	1,030	2403	515	Request for oral hearing	
1452	510	2452	255	Petition to revive – unavoidable	
1453	1,540	2453	770	Petition to revive – unintentional	
1462	400	1462	400	Petition fee under 37 CFR 1.17(f)	
1463	200	1463	200	Petition fee under 37 CFR 1.17(g)	
1464	130	1464	130	Petition fee under 37 CFR 1.17(h)	
1807	50	1807	50	Processing fee under 37 CFR 1.17 (q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	810	2809	405	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	810	2810	405	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	810	2801	405	Request for Continued Examination (RCE)	
				Other fee (specify) ____	

*Reduced by Basic Filing Fee Paid SUBTOTAL (3) ($)510

4. SEARCH/EXAMINATION FEES

1111	510	2111	255	Utility Search Fee	
1112	100	2112	50	Design Search Fee	
1113	310	2113	155	Plant Search Fee	
1114	510	2114	255	Reissue Search Fee	
1311	210	2311	105	Utility Examination Fee	
1312	130	2312	65	Design Examination Fee	
1313	160	2313	80	Plant Examination Fee	
1314	620	2314	310	Reissue Examination Fee	

SUBTOTAL (4) ($)0

SUBMITTED BY				Complete *(if applicable)*	
Name (Print/Type)	John A. Castellano	*Registration No. (Attorney/Agent)*	35,094	*Telephone*	703-668-8000
Signature				*Date*	July 14, 2008

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant: Lars Jørn STENBERG, et al.

Application No.: 10/802,803

Filing Date: March 18, 2004

Group Art Unit: 2615

Examiner: Huyen D. LE

Title: MINIATURE MICROPHONE WITH BALANCED TERMINATION

Attorney Docket: 45900-000791/US

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Randolph Building
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Mail Stop Appeal Brief

July 14, 2008

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 41.37

Madam:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellants submit the following Appeal Brief.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The real party in interest in connection with the present application is Sonion A/S. An assignment of the present application was recorded with the U.S. Patent and Trademark Office on June 18, 2004 on reel/frame no. 015476/0473.

II. RELATED APPEALS AND INTERFERENCES

There are no known appeals, interferences, or judicial proceedings that will directly affect, be directly affected by, or have a bearing on the Board's decision in this Appeal.

III. STATUS OF CLAIMS

Claims 1-10 are pending in the present application, with claim 1 being the sole independent claim. Claims 1-10 stand rejected. Accordingly, claims 1-10 are being appealed, with claim 1 being the only independent claim being appealed.

IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to the February 15, 2008 Office Action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 relates to a miniature MEMS[1] microphone. The microphone may include a single-ended transducer element and amplifier.[2] Referring to a non-limiting, example embodiment depicted in FIG. 1, the single-ended transducer element may be adapted to convert an incoming acoustic wave into an unbalanced electrical signal IN.[3] The amplifier may be adapted to receive the unbalanced electrical signal IN and to generate differential (balanced) electrical signals OUT+ and OUT–.[4] Referring to another non-limiting, example embodiment depicted in FIG. 2, a single-ended transducer element 2 and an ASIC[5] 3 having a differential amplifier may be mounted on a first surface 4 of a substrate 1.[6] The single-ended transducer element 2 may be coupled to the ASIC 3 such that an unbalanced electrical signal IN may be transmitted from the single-ended transducer element 2 to the ASIC 3 via a connector 22.[7] The differential (balanced) electrical signals OUT1 and OUT2 generated by the ASIC 3 may be outputted to pads 11 and 12 provided on a second surface 5 of the substrate 1 as external terminals.[8] Accordingly, the

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1 MEMS is a standard acronym for "microelectromechanical system."
2 *Specification*: p. 3, ln. 18-19.
3 *Specification*: p. 2, ln. 1-2.
4 *Specification*: p. 2, ln. 3-4; p. 3, ln. 18-19.
5 ASIC is a standard acronym for "application-specific integrated circuit."
6 *Specification*: p. 4, ln. 6-8 and 16-17.
7 *Specification*: p. 4, ln. 17-21.
8 *Specification*: p. 4, ln. 26-32.

microphone may have a reduced susceptibility to electromagnetic interference (EMI).[9]

[9] *Specification*: Abstract; p. 5, ln. 25-27.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellants seek the Board's review of the rejection of claims 1-10 under 35 U.S.C. § 103(a) as being unpatentable over WO 01/19134 (Mullenborn) in view of US 6,593,870 (Dummermuth).

VII. ARGUMENTS

A. Rejection of claims 1-10 under 35 U.S.C. § 103(a)

The Examiner takes the position that claims 1-10 are unpatentable over WO 01/19134 (Mullenborn) in view of US 6,593,870 (Dummermuth).[10] Appellants respectfully disagree with the Examiner's position for the reasons provided below.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on an applicant's disclosure.[11]

No Motivation To Modify The Prior Art So As To Achieve The Claimed Invention

The Examiner concedes that Mullenborn does not disclose a miniature MEMS microphone having the "amplifier" as configured in claim 1.[12] As recited by claim 1, the "amplifier" is configured to provide a "**differential** electrical

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10 *Office Action (02/15/2008)*: p. 2, section 3.
11 *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).
12 *Office Action (02/15/2008)*: p. 3, ln. 5-7.

signal on a pair of **terminals** arranged on a substantially plane **exterior** surface part of the miniature MEMS microphone." However, because Dummermuth discloses a differential amplifier, the Examiner concludes that "it therefore would have been obvious to one skilled in the art to provide the amplifier, as taught by Dummermuth, in the microphone system of Mullenborn to generate a **differential** electrical signal for a balanced **output**."[13] Appellants respectfully disagree with the Examiner's rationale for the reasons below.

Mullenborn teaches a system that *outputs* a *non*-differential electrical signal.[14] Similarly, Dummermuth teaches a circuit that generates a *non*-differential *output* signal 106.[15] Although Dummermuth discloses a differential amplifier 708, Appellants note that the differential amplifier 708 is merely employed in conjunction with the comparator bias circuit 701 in an *internal* process to stabilize the operation of the circuit.[16] Thus, the signal manipulation by the differential amplifier 708 is merely in furtherance of generating the *non*-differential *output* signal 106.[17]

Accordingly, Appellants submit that one of ordinary skill in the art would not be motivated to modify the microphone of Mullenborn in view of the teachings of Dummermuth so as to achieve a miniature MEMS microphone configured to provide a "**differential** electrical signal on a pair of **terminals**

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13 *Office Action (02/15/2008)*: p. 3, ln. 9-14.
14 *Mullenborn*: FIGS. 3-4; p. 10, ln. 18-26 (absence of a differential amplifier).
15 *Dummermuth*: FIG. 1, 5-7, and 11 (showing one output signal 106 instead of a *pair* of complementary output signals).
16 *Dummermuth*: FIG. 7, col. 15, ln. 48-62.
17 *Dummermuth*: FIG. 7.

arranged on a substantially plane **exterior** surface part of the miniature MEMS microphone," as recited by claim 1. As discussed above, *neither* Mullenborn *nor* Dummermuth even discloses *outputting* a *differential* signal.

Additionally, the Examiner asserts that the pursuit of "desired *voltage* characteristics" would motivate one of ordinary skill to modify the microphone of Mullenborn in view of the teachings of Dummermuth.[18] Appellants respectfully disagree with the Examiner's rationale for the reasons below.

Dummermuth relates to electrical isolators and teaches that "[e]lectrical isolators are used to provide electrical isolation between circuit elements for the purposes of *voltage* level shifting, electrical noise reduction, and high *voltage* and current protection."[19] The improved electrical isolator developed by Dummermuth is a circuit that utilizes a microelectromechanical system (MEMS) 102.[20] It should be understood that the MEMS of Dummermuth is not a microphone.[21] Rather, the MEMS 102 is merely a device produced by microfabrication technology (micromachine) that generates a position signal 110.[22] Dummermuth teaches that "the circuit acts as an isolated analog-to-digital converter (isolated-ADC)."[23] Furthermore, Dummermuth teaches that

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18 *Office Action (02/15/2008)*: p. 3, ln. 14.
19 *Dummermuth*: col. 1, ln. 9-11 and 14-17.
20 *Dummermuth*: FIGS. 1-7; col. 3, ln. 2-4.
21 Appellants note that the word "microphone" is not even found in Dummermuth.
22 *Dummermuth*: FIGS. 2-4; col. 8, ln. 45 – col. 13, ln. 10.
23 *Dummermuth*: col. 3, ln. 6-7.

an isolated-ADC 700 may employ a differential amplifier 708 and a comparator bias circuit 701 to stabilize the operation of the circuit.[24]

Accordingly, Appellants submit that one of ordinary skill in the art would not be motivated to modify the microphone of Mullenborn in view of the teachings of Dummermuth so as to achieve a miniature MEMS microphone configured to provide a "**differential** electrical signal on a pair of **terminals** arranged on a substantially plane **exterior** surface part of the miniature MEMS microphone," as recited by claim 1. Rather, one of ordinary skill in the art would (at most) only be motivated to operate the microphone of Mullenborn with the circuit of Dummermuth in an electronic device "for the purposes of *voltage* level shifting, electrical noise reduction, and high *voltage* and current protection," as discussed by Dummermuth.[25]

With regard to the differential amplifier 708 disclosed by Dummermuth, the Examiner has failed to show why one of ordinary skill in the art would be motivated to *selectively* pick the differential amplifier 708 from the isolated-ADC 700 to configure with the microphone of Mullenborn so as to achieve the claimed invention.[26] Rather, Appellants submit that one of ordinary skill in the art would, instead, just be motivated to utilize the isolated-ADC 700 *as a whole* to stabilize the operation of the circuit, as taught by Dummermuth.[27]

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24 *Dummermuth*: FIG. 7, col. 15, ln. 48-62.
25 *Dummermuth*: col. 1, ln. 14-17.
26 *Dummermuth*: FIG. 7.
27 *Dummermuth*: FIG. 7, col. 15, ln. 48-62.

Appellants submit that the *discriminative* removal of the differential amplifier from the circuit of Dummermuth for the *selective* modification of the microphone of Mullenborn is the result of hindsight. Appellants would like to emphasize that the claims "as a whole" and the content of the references must be determined at the time the invention was made so as to avoid *impermissible hindsight.*[28]

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[28] *MPEP* 2141.01.

VIII. CONCLUSION

For at least the reasons above, a *prima facie* case of obviousness cannot be established with regard to claim 1. Consequently, a *prima facie* case of obviousness cannot be established with regard to claims 2-10 by virtue of their dependency on claim 1. Accordingly, Appellants respectfully request the Board to reverse the Examiner's rejection.

The Commissioner is authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY, & PIERCE, P.L.C.

By: _____

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JAC/ACC/lo
Acc

IX. CLAIMS APPENDIX

1. (Original) Miniature MEMS microphone, comprising

a single-ended transducer element adapted to receive incoming acoustic waves and to convert a received incoming acoustic wave to an unbalanced first electrical signal, and

an amplifier adapted to receive the first electrical signal, and to generate a differential electrical signal being an amplified version of the first electrical signal, and to provide said differential electrical signal on a pair of terminals arranged on a substantially plane exterior surface part of the miniature MEMS microphone.

2. (Original) Miniature MEMS microphone according to claim 1, wherein the single-ended transducer element is mounted on a first surface of a silicon-based carrier substrate, and wherein a second surface of the silicon-based carrier substrate forms the substantially plane exterior surface part.

3. (Original) Miniature MEMS microphone according to claim 2, wherein the first surface is substantially plane and substantially parallel to the second surface.

4. (Original) Miniature MEMS microphone according to claim 2, wherein the amplifier is mounted on the first surface of the silicon-based carrier substrate.

5. (Original) Miniature MEMS microphone according to claim 2, wherein the amplifier is monolithically integrated with the silicon-based carrier substrate.

6. (Original) Miniature MEMS microphone according to claim 2, wherein the single-ended transducer element is silicon-based.

7. (Original) Miniature MEMS microphone according to claim 2, wherein the amplifier is formed on a silicon-based substrate.

8. (Original) Miniature MEMS microphone according to claim 3, wherein the single-ended transducer and the amplifier are integrated on a silicon-based substrate.

9. (Original) Miniature MEMS microphone according to claim 1, further comprising a housing having an acoustical inlet opening aligned with the single-ended transducer element.

10. (Original) Miniature MEMS microphone according to claim 1, comprising a plurality of single-ended transducer elements adapted to generate unbalanced electrical signals in response to incoming acoustic waves, each of the plurality of unbalanced electrical signals being received by separate amplifiers adapted to provide differential amplified versions of the plurality of unbalanced electrical signals on separate pairs of terminals arranged on the substantially plane exterior surface of the miniature MEMS microphone.

X. EVIDENCE APPENDIX

None.

XI. RELATED PROCEEDINGS APPENDIX

None.